

B. In the Claims:

1. (Currently Amended) A positive electrode active material containing a lithium transition metal composite oxide represented by the general formula $\text{LiCo}_x\text{A}_y\text{B}_z\text{O}_2$ where A denotes at least one element selected from the group consisting of Al, Cr, V, Mn and Fe, and B denotes at least one element selected from the group consisting of Mg and Ca and x, y and z are such that $0.9 \leq x < 1$, $0.001 \leq y < 0.05$, and $0.001 \leq z < 0.05$; and

wherein a band-shaped positive electrode comprising a metal foil is coated with a positive electrode mixture containing the positive electrode active material and a binder, the metal foil being coated by the mixture on both surfaces of the metal foil; and the positive electrode being spirally wound with a negative electrode by interposing a separator in-between.

2. (Currently Amended) A non-aqueous electrolyte secondary cell comprising:

(a) a positive electrode,

(b) a negative electrode, and

(c) a non-aqueous electrolyte interposed between said the positive and negative electrodes, said the positive electrode using having a positive electrode active material containing a lithium transition metal composite oxide represented by the general formula $\text{LiCo}_x\text{A}_y\text{B}_z\text{O}_2$ where A denotes at least one element selected from the group consisting of Al, Cr, V, Mn and Fe, and B denotes at least one element selected from the group consisting of Mg and Ca, and x, y and z are such that $0.9 \leq x < 1$, and $0.001 \leq y < 0.05$, and $0.001 \leq z < 0.05$; and the non aqueous electrolyte comprises a lithium salt dissolved in the electrolyte.

3. (Currently Amended) A The non-aqueous electrolyte secondary cell according to claim 2, wherein said the negative electrode uses an active material capable of doping/undoping lithium

ions; said the active material being such an active material including a material selected from the group comprising consisting of a carbonaceous material, an alloy material, and a polymer including polyacetylene polymer.

4. (Currently Amended) A The non-aqueous electrolyte secondary cell according to claim 3, wherein said the negative electrode active material, capable of doping/undoping of lithium ion, comprises a carbonaceous material which comprises at least one of a is selected from the group of a pyrocarbons, pitch coke, needle coke, petroleum coke, graphite, vitreous carbon fibers, sintered organic polymer compounds, carbon fiber, and activated charcoal.

5. (Currently Amended) A The non-aqueous electrolyte secondary cell according to claim 3, wherein said the negative electrode is a material that can be alloyed with lithium and includes a compound represented by a chemical formula $M_xM'_yLi_z$ where M is a typical an element of the group 3A3B or a metal other than the group 4A4B excluding carbon, M' is one or more metal element other than the element Li and the element M, x is a numerical value larger than 0, and y, z are numerical values not less greater than 0.

6. (Currently Amended) A The non-aqueous electrolyte secondary cell according to claim 2, wherein said the electrode is a band-shaped positive electrode coated with a positive electrode mixture containing the positive electrode active material on both surfaces of a metal foil; and a band-shaped negative electrode, said positive the negative electrode coated with a negative electrode mixture containing the negative electrode active material on both surfaces of a metal foil and said the negative electrode being stacked and spirally wound by interposing a separator in-between.

7. (Currently Amended) A The non-aqueous electrolyte secondary cell according to claim 2, wherein said the electrolyte is a solution of an electrolyte in a non-protonic non-aqueous solvent.

8. (Currently Amended) A The non-aqueous electrolyte secondary cell according to claim 7, wherein said the electrolyte is a solution of a mixture of one or more ~~selected from~~ cyclic carbonates or chained carbonates.

9. (Currently Amended) A The non-aqueous electrolyte secondary cell according to claim 7 8 wherein said the electrolyte comprises, as the cyclic carbonate, ~~a solvent selected from the group consisting of at least one of~~ an ethylene carbonate, propylene carbonate, butylene carbonate, vinylene carbonate and gamma butyrolactone, said the electrolyte comprising, as the chained carbonate, a solvent selected from the group consisting of dimethyl carbonate, diethyl carbonate, and dipropyl carbonate.

10. (Currently Amended) A method for the preparation of a positive electrode active material comprising the steps of:

(a) mixing a cobalt compound, a lithium compound, a compound of at least one element selected from the group consisting of aluminum, chromium, vanadium, manganese and iron and a compound of at least one element selected from the group consisting of magnesium and calcium, at a pre-set ratio; and

(b) sintering a mixture from said the mixing step to produce a compound represented by the general formula $\text{LiCo}_x\text{A}_y\text{B}_z\text{O}_2$ where A denotes at least one element selected from the group consisting of Al, Cr, V, Mn and Fe, and B denotes at least one element selected from the group

consisting of Mg and Ca, and x, y and z are such that $0.9 \leq x < 1$, $0.001 \leq y \leq 0.05$, and $0.001 \leq z \leq 0.05$;

~~said the~~ compound of at least one element selected from the group selected from the group consisting of magnesium and calcium, as used in ~~said the~~ mixing step, being magnesium carbonate or calcium carbonate.

11. (Currently Amended) A method for the preparation of a non-aqueous electrolyte secondary cell comprising a positive electrode, a negative electrode, and a non-aqueous electrolyte interposed between ~~said the~~ positive and negative electrodes, comprising, in producing ~~said the~~ positive electrode, the steps of:

(a) mixing a cobalt compound, a lithium compound, a compound of at least one element selected from the group consisting of aluminum, chromium, vanadium, manganese and iron and a compound of at least one element selected from the group consisting of magnesium and calcium, at a pre-set ratio; and

(b) sintering a mixture from ~~said the~~ mixing step to produce a compound represented by the general formula $\text{LiCo}_x\text{A}_y\text{B}_z\text{O}_2$ where A denotes at least one element selected from the group consisting of Al, Cr, V, Mn and Fe, and B denotes at least one element selected from the group consisting of Mg and Ca, and x, y and z are such that $0.9 \leq x < 1$, and $0.001 \leq y \leq 0.05$, and $0.001 \leq z \leq 0.05$; and

~~said the~~ compound of at least one element selected from the group consisting of magnesium and calcium, as used in ~~said the~~ mixing step, being magnesium carbonate or calcium carbonate.

12. (Currently Amended) A The method for the preparation of a non-aqueous electrolyte secondary cell according to claim 11, wherein said the negative electrode containing contains an active material capable of doping/undoping lithium ions; said the active material is selected from the group consisting of a comprising a carbonaceous material, and a polymer including polyacetylene polymer.

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13. (Currently Amended) A The method for the preparation of a non-aqueous electrolyte secondary cell according to claim 12, wherein said the negative electrode, capable of lithium doping/undoping of lithium ion, comprises carbonaceous material which is selected from the group consisting of a pyrocarbon, pitch coke, needle coke, petroleum coke, graphites, vitreous carbon fibers, sintered organic high polymer compounds, carbon fiber, and activated charcoal.

14. (Currently Amended) A The method for the preparation of a non-aqueous electrolyte secondary cell according to claim 12, wherein said the negative electrode is a material that can be alloyed with lithium and includes a compound represented by a chemical formula $M_xM'yLi_z$ where M is a typical an element of the group 3A3B or a metal other than the group 4A4B excluding carbon, M' is one or more metal element other than the element Li and the element M, x is a numerical value larger than 0, and y, z are numerical values not less greater than 0.

15. (Currently Amended) A The method for the preparation of a non-aqueous electrolyte secondary cell according to claim 11 wherein said the electrode is a band-shaped positive electrode coated with a positive electrode mixture containing the positive electrode active material on both surfaces of a metal foil, and a band-shaped negative electrode coated with a

negative electrode mixture containing the negative electrode active material on both surfaces of a metal foil, said the positive electrode and said the negative electrode being stacked and wound spirally by interposing a separator in-between.

16. (Currently Amended) A The method for the preparation of a non-aqueous electrolyte secondary cell according to claim 11, wherein said the electrolyte is a solution of an electrolyte in a non-protonic non-aqueous solvent.

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17. (Currently Amended) A The method for the preparation of a non-aqueous electrolyte secondary cell according to claim 16, wherein said the electrolyte is a solution of a mixture of one or more selected from cyclic carbonates or chained carbonates.

18. (Currently Amended) A The method for the preparation of a non-aqueous electrolyte secondary cell according to claim 16, wherein said the electrolyte uses, as the cyclic carbonate, a solvent selected from the group consisting of ethylene carbonate, propylene carbonate, butylene carbonate, vinylene carbonate and gamma butyrolactone, said the electrolyte using, as the chained carbonate, a solvent selected from the group consisting of dimethyl carbonate, diethyl carbonate, and dipropyl carbonate.

19. (Currently Amended) A The method for the preparation of a non-aqueous electrolyte secondary cell according to claim 16, wherein said electrolyte comprises one of the inorganic solid electrolyte and a high molecular solid electrolyte as material exhibiting lithium ion conductivity.

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20. (Currently Amended) A The method for the preparation of a non-aqueous electrolyte
secondary cell according to claim 16 wherein said the electrolyte comprises one or more lithium
salts selected from the group consisting of LiCl, LiBr, LiPF₆, LiClO₄, LiAsF₆, LiBF₄, LiCH₃SO₃,
LiCF₃SO₃, LiN(CF₃SO₂)₂, or LiB(C₆H₅)₄.